Honors Math II
Unit 1.5 notes: rational exponents

Name_____
Period_____Date_____

Bell work

Simplify:

1. $\sqrt{108}$

2. $-3\sqrt[3]{5}+7\sqrt[3]{5}$

3. $-2\sqrt{2}(2\sqrt{3}+4\sqrt{6})$

4. $\frac{\sqrt{5}}{3\sqrt{12}}$

Is the conjecture $\sqrt{x^2}=x$ true for all numbers x?

Use the same exponent rules as before, but this time with rational exponents.

Rule: $\boldsymbol{a^m \cdot a^n = a^{m+n}}$

$\sqrt[3]{5}\cdot 5^{\frac{3}{2}}=$

$2^{\frac{3}{4}}\cdot 2^{.5}=$

Rule: $\boldsymbol{(a^m)^n = a^{m\cdot n}}$

$\left(3^{\frac{5}{2}}\right)^2=$

$4(16)^{.25}=$

Rule: $\boldsymbol{(ab)^m = a^m b^m}$

$(16\cdot 9)^{.5}=$

$(100n^4)^{\frac{3}{2}}=$

Rule: $\boldsymbol{a^{-m}=\frac{1}{a^m}}$

$36^{-\frac{1}{2}}=$

$x^{\frac{-4}{3}}=$

Rule: $\frac{a^m}{a^n} = a^{m-n}, a \neq 0$

$\frac{3^2}{3^{\frac{1}{2}}} =$

$\frac{x^{\frac{1}{2}}}{x^2} =$

Rule: $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

$\left(\frac{27}{64}\right)^{\frac{1}{3}} =$

$\left(\frac{2}{3}\right)^{\frac{1}{2}} =$

Product Property of Radicals: $\sqrt[n]{a \cdot b} = \sqrt[n]{a} \cdot \sqrt[n]{b}$

$\sqrt[3]{12} \cdot \sqrt[3]{18} =$

Division Property of Radicals: $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$

$\frac{\sqrt[4]{80}}{\sqrt[4]{5}} =$

$\sqrt[3]{\frac{108}{4}} =$

Simplify:

$\sqrt[3]{64y^6} =$	$(27p^3q^{12})^{\frac{1}{3}} =$
$\sqrt[4]{\frac{m^4}{n^8}} =$	$\frac{14xy^{\frac{1}{3}}}{2x^{\frac{3}{4}}z^{-6}}$
$\sqrt[5]{4a^8b^{14}c^5} =$	$\sqrt[3]{\frac{x}{y^8}} =$

Simplify:

$\sqrt{\sqrt[3]{x}} =$

$\sqrt[3]{\sqrt{64}} =$

$\sqrt{5} \cdot \sqrt[3]{5} =$

$\sqrt[3]{n} \cdot \sqrt[4]{n} =$

$\frac{\sqrt{18} \cdot \sqrt{10}}{\sqrt{24}} =$

$\frac{\sqrt{6} \cdot \sqrt{14}}{\sqrt{21}} =$

True or False?

$8^{\frac{1}{2}} + 8^{\frac{1}{3}} = 8^{\frac{5}{6}}$

Write each expression in radical form.

$(4m)^{\frac{2}{3}}$

$4m^{\frac{2}{3}}$

Write each expression in exponential form.

$\sqrt{6n}$

$6\sqrt{n}$